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October 13, 2011

Steven Klafka, P.E., BCEE

Environmental Engineer

Wingra Engineering, S.C.

303 South Paterson Street

Madison, WI 53703

Re: Madison Kipp Corporation – Chlorinated Organic Contamination Issues

Dear Mr. Klafka,

Per your request I have reviewed WDNR file information including the recent groundwater monitoring results from MW-7, 8 and 9. I also attended the public informational meeting on June 15, 2011 and have had discussions with Henry Nehls-Lowe, Wisconsin Department of Health Services and Mike Schmoller, Wisconsin Department of Natural Resources. The focus of my review was to determine what significant health threats to the neighborhood surrounding the Madison Kipp facility are posed by the historic release of chlorinated solvents and what further actions could be taken to address these threats. I also have included specific comments regarding the September 29, 2011 draft of the Madison Kipp scope of work for environmental response activities.

General Comments

It appears that the major sources of tetrachloroethene (PCE), and its associated breakdown products of trichloroethylene (TCE), dichloroethene (DCE), and vinyl chloride (VC), were from product storage in the vicinity of MW-3 and degreaser vents in the vicinity of MW-5. It is also possible that spillage or poor disposal practices could have resulted in PCE contamination anywhere on the property accessible by Madison Kipp workers or others handling the PCE. I also noted that soil borings indicated that black foundry sand was found in fill materials at the Madison Kipp site. Foundry sand wastes have been known to be associated with chlorinated solvents as well as lead.

In spite of attempts at soil remediation in PCE source areas, significant contamination in soil, soil vapor, and groundwater remains at the site. The degree and extent of the contamination has not been adequately determined and the extremely close proximity of the contaminant releases to the neighboring residents poses a continuing significant health risk to these residents.

There are two most immediate contaminant threats to the residents. One is though direct contact with the soils on their property that may have been contaminated by PCE-containing degreasing vent vapors or condensate. The second is from chlorinated solvent vapors that may enter house foundations from the subsurface. The soil vapors can travel directly from the source areas through the unsaturated soil pores to the house foundations or outgas from contaminated groundwater into the unsaturated soil in the vicinity of the house foundation. Over most of site area a low permeability upper clay soil layer of four to ten feet thick overlies 20 to 25 feet of more permeable sandy soils which overlie sandstone bedrock. The ground water table is found approximately 25 to 30 feet below the surface in the sandy soils or sandstone. The clay soil cover allows the underlying unsaturated sandy soils to act a conduit for contaminant vapor migration in that the contaminated vapors cannot easily escape to the surface or disperse below the water table. The saturated sandy soils would tend to become a preferential contaminant groundwater pathway because they are likely to be more permeable than the underlying sandstone. Groundwater monitoring suggests the predominant water table flow direction is to the east. Significant groundwater contamination documented to exist at depths some distance below the water table is associated with a northward flow direction and does not pose an immediate threat to the adjacent residents, though it represents a potential City of Madison water supply risk.

Recommended Monitoring

In order to minimize risk to adjacent residents the significant vectors for contaminant movement to the residents must be monitored so that remedial activities can be taken wherever warranted. I recommend additional monitoring points as shown on the attached figure. I have proposed that nine additional subsurface monitoring points (as shown by the blue triangles) be established along the Madison Kipp boundary with the back yards of the Marquette St. residents. Each of the points would include a water table well to be analyzed for VOCs. Detection of PCE greater than 5 *u*g/l in the groundwater would indicate the presence of significant risk of associated soil vapor contamination for adjacent residents. Each point should also include a pair of soil vapor probes to be monitored for VOCs. It is critical that one probe should be screened in the unsaturated sand layer immediately underlying the clay soils. Another probe should be screened at the same depth as the adjacent house foundation (basement floor or slab).

I propose two additional water table wells along Marquette Street, one north of MW8 and one south of MW7. These wells will help to better define both the water table gradient and potential contaminant migration directions, but will also confirm the preliminary results of MW7 and MW8 that the water table contaminants that pose the greatest risk to residents have not migrated east of Marquette St.

I propose three additional pairs of soil vapor probes to be located in the back yards of the residents along Waubesa St. that are immediately adjacent Madison Kipp (shown as blue crosses). These probes should be constructed and monitored as the probe pairs recommended above.

It is noted that the Madison Kipp scope of work proposes soil vapor probes in locations similar to those I have recommended. My recommendations differ in that I have proposed two probes per location targeting depths critical to evaluating the contaminant migration pathways of most significance. My probe locations also extend both further to the north and south at the Marquette St. residences and further to the south for the Waubesa St. residents. The Madison Kipp work plan does not include any additional water table wells which I believe are needed to determine the significance of potential out gassing of volatile contaminants from the water table into the soils surrounding the houses.

Residential Soil Remediation/Removal

The removal of the upper foot of soil, where practical, from the back yards of 146, 150, 154, 162, and 166 South Marquette St. appears to be a reasonable remediation option considering the past soil detection in the areas adjacent the degreaser vent. The reliability and validity of the soil testing protocol proposed for residences north and south of the remediation areas might be increased by also including additional soil samples, perhaps two per residence, to be located in the back yards of residences in areas approximately five to ten feet from the property line. This could be included for any property owner that provides the necessary access. The remediation action level (RAL) proposed for PCE of 123 ppb appears appropriate, but the recent EPA risk assessment results for trichloroethene (TCE) suggests the proposed RAL of 1.43 mg/kg (ppm) may need to be reduced. It is noted that the New York clean up standard for TCE for unrestricted sites is 0.47 ppm so perhaps a RAL of 50% of that standard, i.e. 235 ppb, would be appropriate. Since the proposed vinyl chloride RAL of 0.382 mg/kg (ppm) is much greater than the New York unrestricted site clean up level of 0.02 ppm this RAL nay also need to be reduced. Since vinyl chloride, as a breakdown product of the original PCE contamination, represents a relatively minor component of the VOC contamination present, and it has a relatively high vapor pressure leading to rapid volatilization from exposed soil, the overall health concern regarding this contaminant is low at the site.

Additional Remedial Activities

On site remediation currently includes in-home soil vapor extraction (SVE) at 146, 150, 154, 162, and 166 South Marquette St. residences with system modifications planned to meet deficiencies identified in a June 27, 2011 letter from the Wisconsin Department of Health Services. The proposed Madison Kipp work plan also includes a SVE pilot test in the vicinity of MW5. If determined feasible, the SVE system should be expanded to provide vapor control wherever the monitoring, as recommended above, indicates vapors from either direct soil sources or indirectly through groundwater transport indicates a potential hazard.

The proposed Madison Kipp scope of work includes additional ozone groundwater sparging at MW2D and MW3 to complement that currently used in the MW5 area. This remedial activity may address the significant groundwater contaminants found at depth that pose a threat to the Madison municipal water

supply. It is not clear how the effectiveness of this remediation could be determined without additional groundwater monitoring points placed adjacent the sparging points prior to remediation so that baseline and post remediation sampling could determine the degree and lateral extent of remediation.

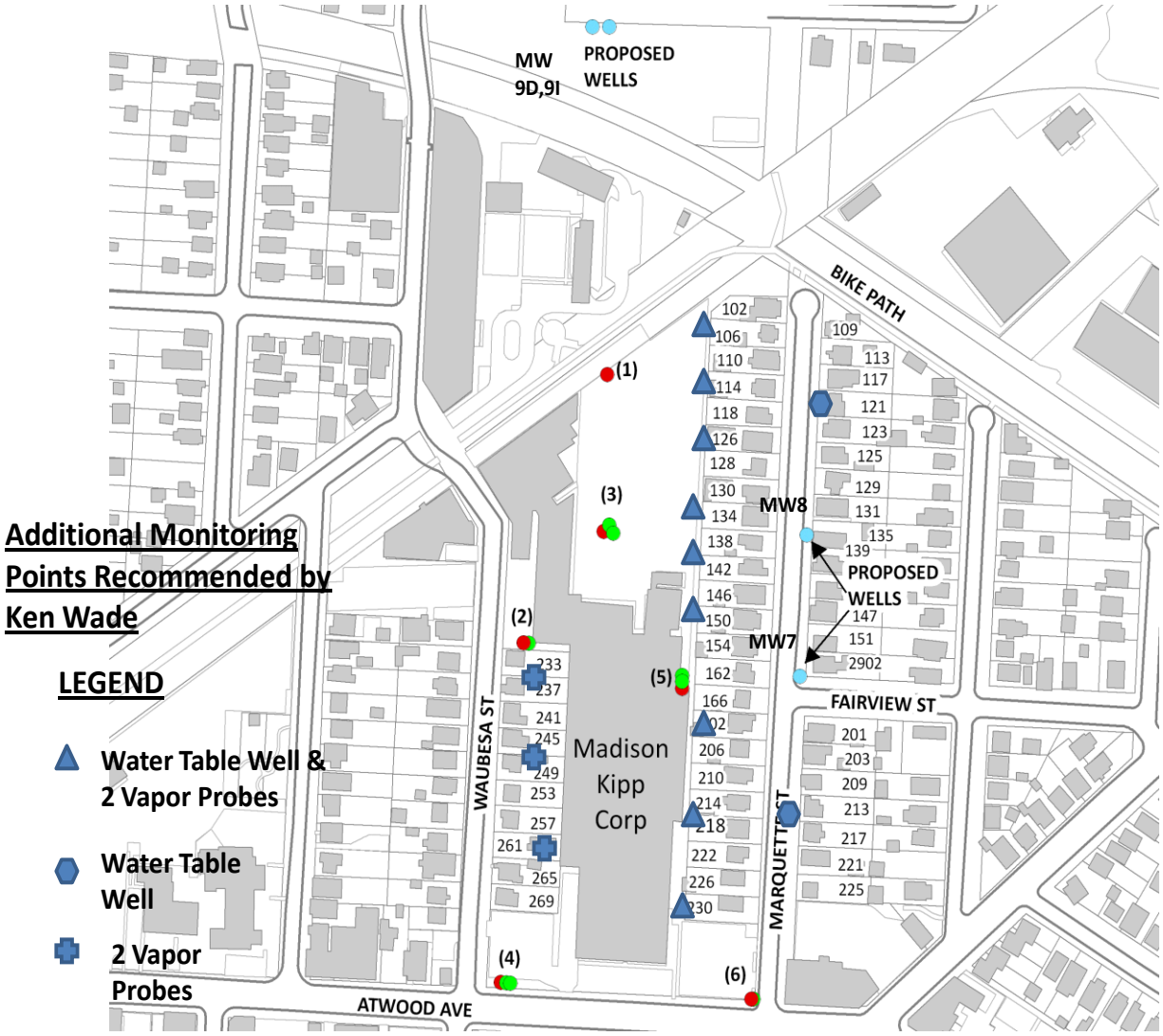
Conclusion

The continuing release and migration of chlorinated solvents as soil vapor and in the shallow groundwater requires a much more comprehensive monitoring program than currently exists or is proposed per the Madison Kipp scope of work for remedial activities. It is critical a comprehensive monitoring program be established to allow for risk assessment for the health of the nearby residents. Once all vectors of significant contamination migration are evaluated through monitoring then remediation systems, including SVE, can be targeted to those areas of concern.

Please let me know if you have any questions regarding my comments.

Sincerely,

Kenneth S. Wade, P.E., P.G.



Additional Monitoring Points Recommended by Ken Wade

LEGEND

- **Water Table Well & 2 Vapor Probes**
- **Water Table Well**
- **2 Vapor Probes**